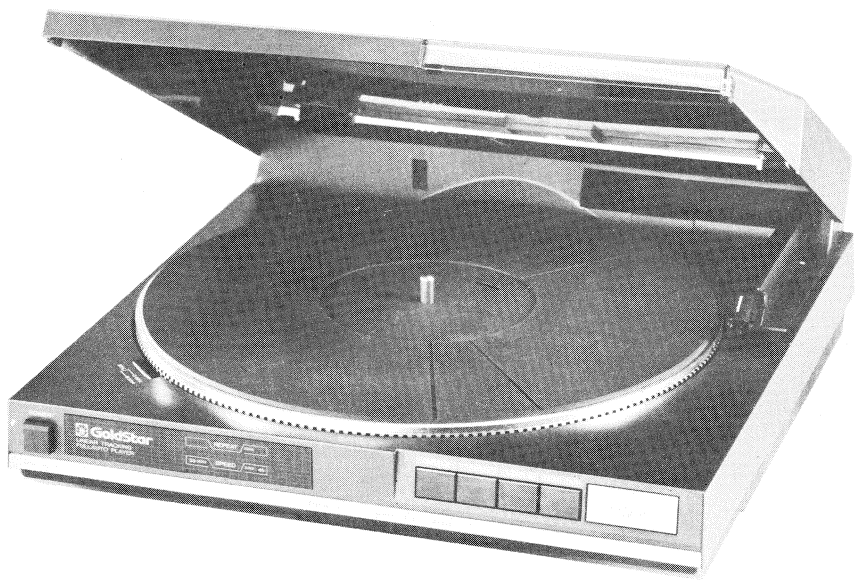
GoldStar

Service Manual

GSP-700

DIRECT DRIVE
LINEAR TRACKING TURNTABLE
MODEL GSP-700



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SV5-106B

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FEATURES

Linear Tracking, Fully Automatic Direct Drive Turntable

SPECIFICATIONS

TURNTABLE

Motor	20-pole 30-slot 3-phase brushless type DC servo controlled direct-drive motor
Speeds	33-1/3 and 45 r.p.m.
Speed calibration	Pitch control ±3%
Wow & Flutter	0.065% WRMS
Rumble	62dB DIN B(weighted)
Turntable platter	296mm aluminum alloy die-cast with strobe outside rim (for 33-1/3 r.p.m.)

TONEARM

Effective length	132mm
Tracking error	Within 0.1"
Usable cartridge	Universal, P-mount type

CARTRIDGE

Type	P-mount system, Model AT-3482P (Audio Technica) with 0.6mil stylus Magnet type
Frequency response	20-20,000 Hz
Output voltage	6mV (≧ 4mV) at 1 KHz, Veff = 5.6cm/sec
Channel balance	Within 2dB at 1 KHz
Channel separation	More than 18dB at 1 KHz
Load resistance	47 Kω
Weight	5.9 gram

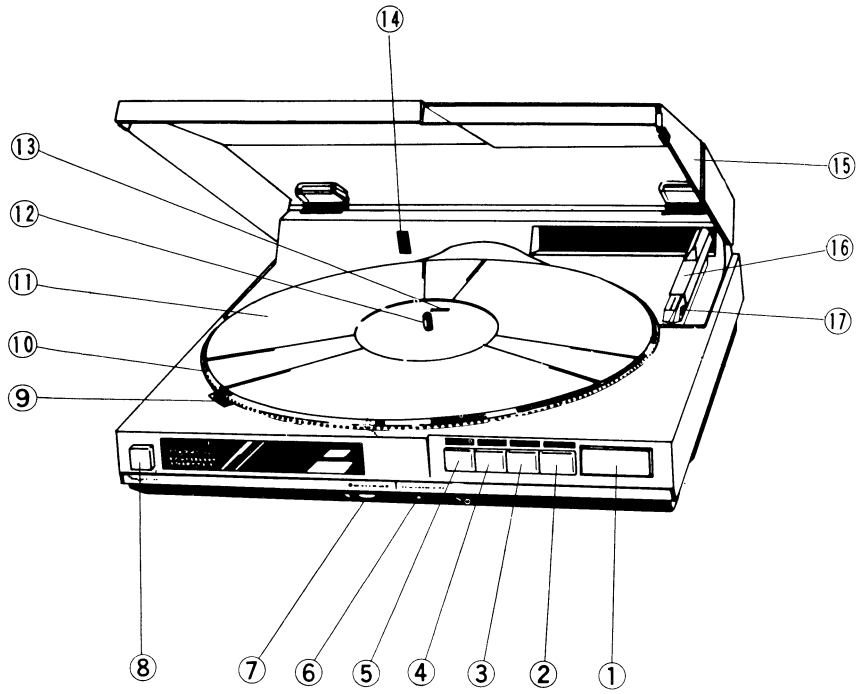
OPERATION

	Microcomputer-controlled fully automatic: Automatic start. return, repeat and record size selector by beam sensor
Cueing	DC motor controlled
Muting	Reed relay method avoiding shock noise
Speed selector	Automatic selection by beam sensor(switchable for manual operation)

GENERAL

Power-source	220V/50 Hz
Power consumption	10 watts
Dimensions	342(W) × 102(H) × 350(D) mm
Weight	5.5 Kg

DESIGNATION OF PARTS



1. PLAY/REJECT button
2. LEAD OUT button
3. LEAD IN button
4. CUEING button
5. REPEAT button
6. SPEED selector button
7. PITCH Control knob
8. POWER button
9. Neon lamp
10. Platter
11. Rubber mat
12. Center shaft
13. Record size/Safety searcher crest
14. Record size/Safety searcher light
15. Dust cover
16. Tone arm
17. Cartridge

T4P

1. MECHANISM OPERATING PRINCIPLES

(A) RECORD SIZE SEARCHER MECHANISM

An optical sensor equipped with this unit automatically searches the size of record and the existence of record as well. The sensor system consists of the lamp, photo transistor and the slits on turntable platter.

One of the two slits on turntable platter has the crest which works as a shutter. When no record is placed on the platter, the photo transistor receives light from the lamp twice a turn through the two slits; when a 17 cm record is placed, the photo transistor receives light once a turn through the slit without crest.

The pulse of light which photo transistor gets is transmitted to the microcomputer, and the pulse of light is sensed as the size or the non-existence of record by the Microcomputer (IC001). Then the microcomputer transmits the command-signal of speed to the motor: for 30 cm record 33-1/3 rpm, for 17 cm record 45 rpm, for no record no rotation.

(B) TRACKING ERROR CORRECTION MECHANISM

The tonearm tracking error is searched by the Sensor (PI701) on Phono PWB (101) and the base cyilnder mounted to the tonearm. The sensitivity of the sensor has been adjusted by (VR551). No tracking error point has been settled by the correct positioning of phono PWB with (VR552). The tracking error, if occurs, will be corrected as follows:

When the tracking error angle is created, the intensity of light which the sensor gets will be varied. The variety of intensity of light will be converted to the current which flows the sensor. The degree of tracking angle is almost in direct proportion to the current near 0 degree with correct adjustment of positioning.

The current will be converted to the voltage and will be then amplified so that the signal amplified starts rotating the Servo-controlled Motor (75). The rotation of the motor will be transmitted to the Worm Gear "A" (42) by the Belt (45). The Worm Wheel "A" (46) bited the worm gear "A" will roll the wire so that the Base Mech Assy (59) on which the tonearm stands will be moved.

When the tonearm is moved to the position where the tracking error angle is disappeared, the shutter plate will obstruct the light to the sensor. The current will become lower, the voltage will become lower too, and then servo-controlled motor will stop rotation.

2. DISASSEMBLY INSTRUCTIONS

(A) TOOLS REQUIRED FOR DISASSEMBLY

Phillips-head screwdrivers: for M2 and M3
Slotted-head screwdrivers: for the width 2.5~4 and 5~7.5 mm

(B) REMOVE CABINET UPPER (1) AS FOLLOWS:

1. In case that the tonearm starts moving normally.

1-1. Press the POWER KNOB (6) so that the power will be switched off, and remove the turntable platter and mat (Fig. 1).

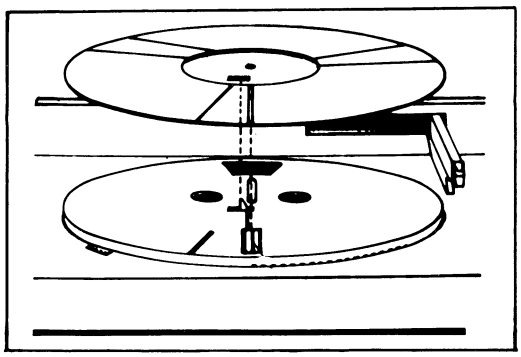


Figure. 1

1-2. Place the turntable upside down on a suitable bench.

1-3. Remove the seven Screws (106) which mount the Cabinet bottom (29) (Fig. 2).

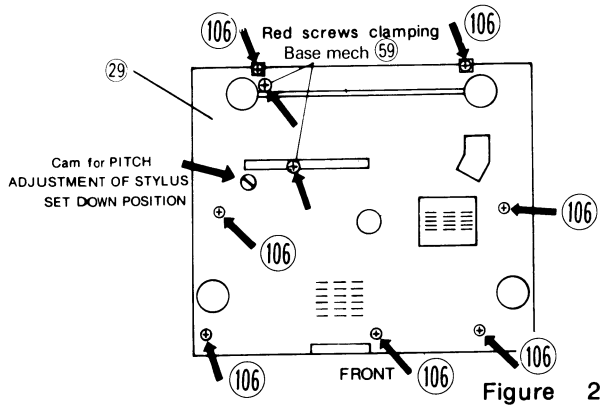


Figure 2

1-4. Reverse the turntable.

1-5. Remove the screw (115) which mounts the Cover (15) to the Cabinet upper (1).

1-6. Remove the Cover (15) from the Cabinet upper by drawing it (Fig. 3).

1-7. Press the POWER button so that the power will be switched on and remove the tonearm to the position where the Cover (15) was mounted, pressing the button.

1-8. Press the POWER button to switch the unit off.

1-9. Remove the three Screws (105) which mount the Cabinet upper (Fig. 4) and lift the Cabinet upper.

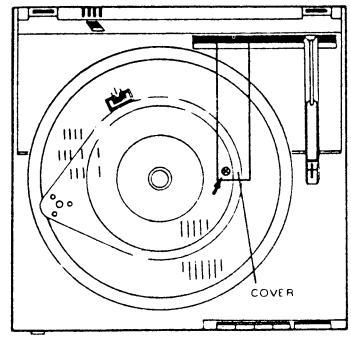


Figure. 3

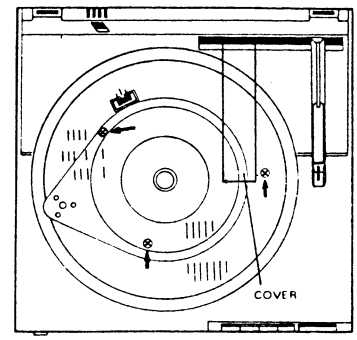


Figure 4

2. In case that the tonearm does not start moving with trouble.

2-1. If the tonearm is above or on the turntable platter, remove hole bracket. And turn the Pulley (44) counterclockwise through the hole referring to Fig. 5 with the slotted-head screwdriver (width 2.5~4 mm) until tonearm moves to its rest position.

2-2. Remove the turntable platter and mat.

2-3. Follow the same steps as described above 1-2, 1-3, 1-4, 1-5 and 1-6.

2-4. Move the tonearm to the position where the Cover (15) was mounted, turning the Pulley (44) clockwise (Fig. 5).

2-5. Follow the same step as described above 1-2, 1-3, 1-4, 1-5, 1-6 and 1-9.

NOTE: If the tonearm does not move by turning the Pulley (44) (Fig. 5), an additional force by finger should be added to the bended part of tonearm in the desired direction.

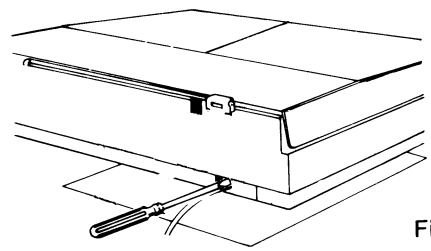


Figure 5

(C) REMOVE THE BASE MECH ASSY (59) AS FOLLOWS:

1. After removing the cabinet upper, remove tracking PCB Assy (86) referring to Fig. 6.
2. Remove the Belt (45) between Servo-controlled Motor (75) and Pulley (74).
3. Remove the Bearing Assy (41) referring to Fig. 7.

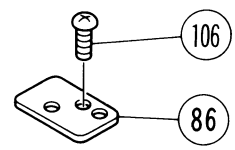


Figure 6

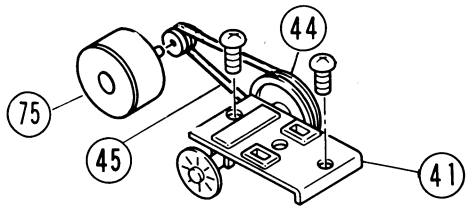


Figure. 7

4. After removing the Screw (111) described in Fig. 8, remove BASE MECH ASS'Y (59) by lifting the left end of the Pipe (55).

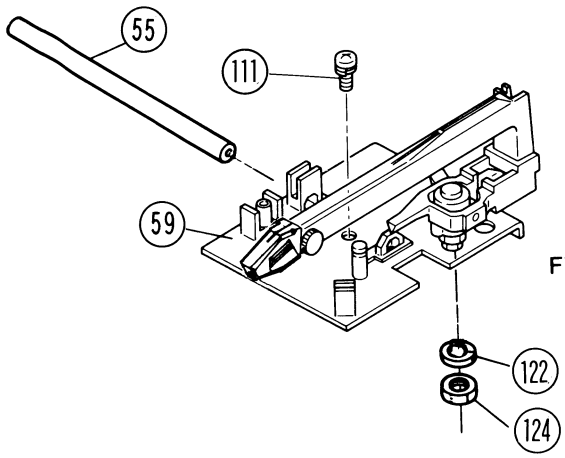


Figure 8

(D) REMOVE THE TONEARM ASSY (78) AS FOLLOWS:

1. Unsolder the five lead-wires on Phono PWB Assy (101) coming from tonearm.
2. Remove the Phono PWB Assy which is mounted to the BASE MECH ASS'Y (59) by two Screws, (103) and (114) (Fig. 9).
3. Remove the Hexagon Nut (124) and Spring Washer (122) to remove the Tonearm assy (Fig. 8).
   NOTE: When the Phono PWB Assy (101) is mounted, make sure to refer to TRACKING SENSOR SENSITIVITY AND NO TRACKING ERROR adjustment (ADJUSTMENT C, page 6).

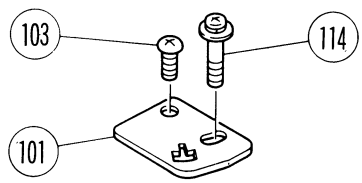


Figure 9

(E) REMOVE THE SWITCH (77) ON THE BASE MECH ASSY (59) AS FOLLOWS:

1. Remove the E type Washer (126) 2ϕ on BASE MECH ASS'Y (59).
2. Remove the Washer (117) and Spring (72).
3. Remove the BRACKET ASS'Y-LIFTER (60).
4. Remove the Screw (112) (Fig. 10).

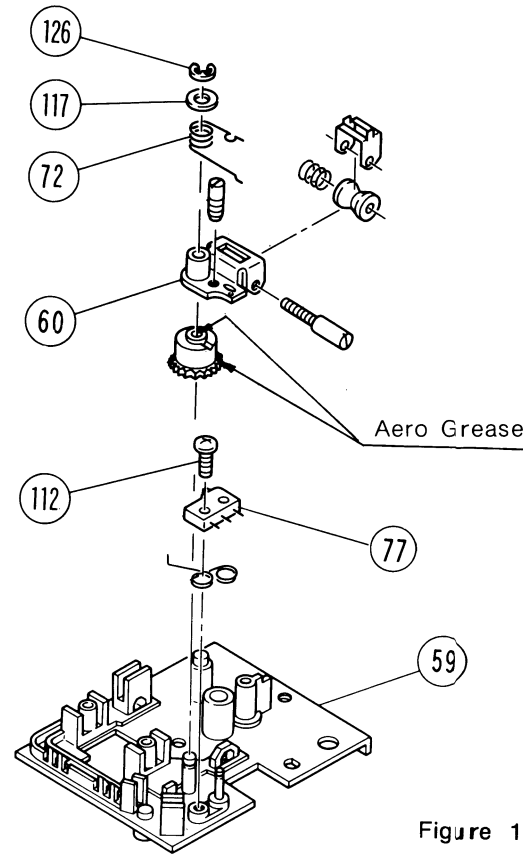


Figure 10

(F) REMOVE THE WORM GEARS, (42) AND (66), AS FOLLOWS:

1. Worm gears have been press-insert mounted. When worm gears are lifted, make sure to apply an equal force to each connecting parts (Fig. 11).
2. To lift the Worm Gear (66) remove the two Screws (113).

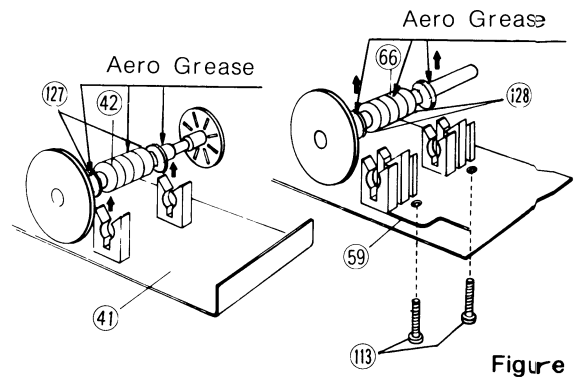


Figure 11

3. REPLACING AND REASSEMBLY INSTRUCTIONS

(A) REPLACE THE WIRE ASSY (49) AS FOLLOWS:

1. Prior to mounting, Wire Assy (49) should be rolled Three turns by Worm Wheel "A" (46) (Fig. 12).
2. Place the Worm Wheel "A" (46) to the Shaft (47), and rotate the worm wheel "A" clockwise until the starting point of the wire (slit on pulley) comes to the Point A (Fig. 13).
3. Rotate the Worm Wheel "A" (46) then counterclockwise until the

point A comes to the point B.

4. Place the Wire Bracket (50) to the depressed part on Cabinet bottom (29) (Fig. 12).
5. This position will correspond to the most left possible location of BASE MECH Ass'y (59)

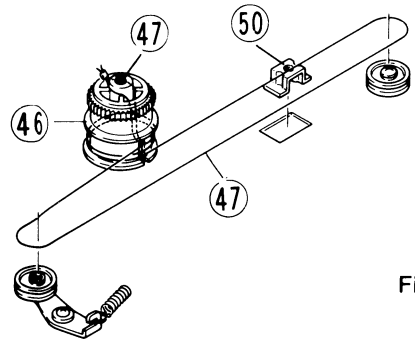


Figure 12

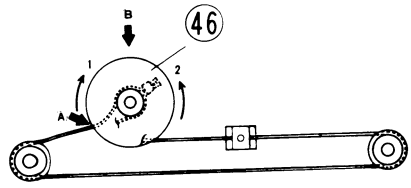


Figure 13

(B) REPLACE THE WORM WHEEL "B" (71) WITH FOLLOWING CAUTION:

When Worm Wheel "B" (71) is replaced, make sure that the depressed part on the Worm Wheel "B" should be mounted facing with the Spindle Shaft of Tonearm (78) (Fig. 14)

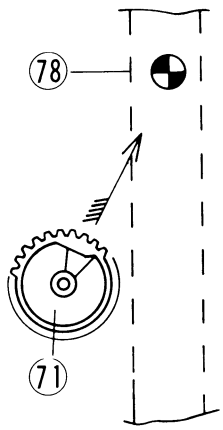


Figure. 14

(C) REASSEMBLY THE WORM GEAR ASS'Y, (42) AND (66) WITH FOLLOWING CAUTIONS:

1. **Worm gear "B" (66) Assy**
   Pressing insert the Pulley "B" (67) to the Worm Gear "B" (66) so that left end of the worm gear "B" will be on the same level as the face of the smaller circle in the pulley "B" (Fig. 15).

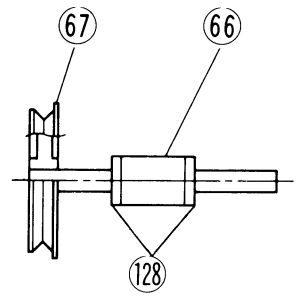


Figure 15

2. **Worm gear "A" (42) Assy**
   As described in Fig. 16 pressing insert the Encorder (43) and pulley "A" to the long and short bars of Worm Gear "A" (42) respectively. When the Encorder (43) is assembled, make sure that the left end of the bar is on the same level as the face of the shorter boss of encorder. When the Pulley "A" (44) is assembled, press the pulley "A" as long as it goes.

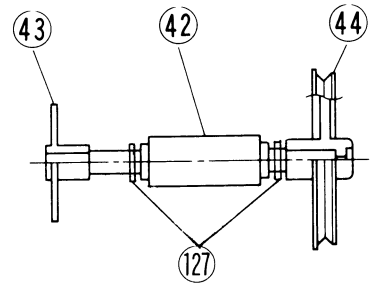


Figure 16

(D) REASSEMBLY THE MOTORS, (76) AND (75), WITH THE FOLLOWING CAUTIONS:

1. When the Pulley (73 or 74) is mounted to the Motor (76 or 75), make sure to have the specified clearance between the pulley and the motor referring to Fig. 17 and Fig. 18.
2. After mounting the pulley, apply quick-dry adhesive agent.

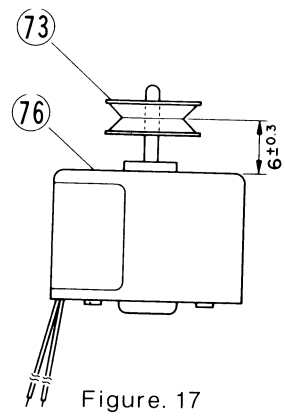


Figure. 17

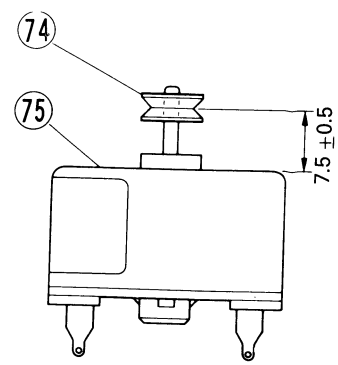


Figure. 18

(E) TO REASSEMBLY, USE DISASSEMBLY INSTRUCTIONS IN REVERSE

4. ADJUSTMENTS

(A) STYLUS POINT HEIGHT

1. Remove the Cabinet upper according to DISASSEMBLY INSTRUCTIONS (B) (page 3).
2. Turn the Screw (65) described in Fig. 19 so that the clearance between stylus and turntable platter will be within 8 ~ 10 mm when the tonearm is in up position (Fig. 20).

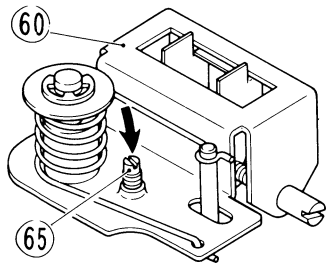


Figure 19

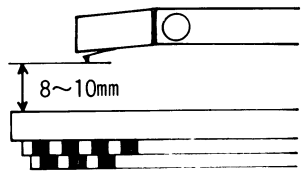


Figure 20

(B) TONEARM SETUP POSITION

1. Remove the Cabinet upper according to DISASSEMBLY INSTRUCTIONS (B) (page 3.)
2. Turn the Guide adjust screw (62) described in Fig. 21 so that the tonearm will be mounted at right angles with its moving direction (Fig. 22).
3. After this adjustment, make sure to apply "NO TRACKING ERROR" adjustment (ADJUSTMENT D, page 7).

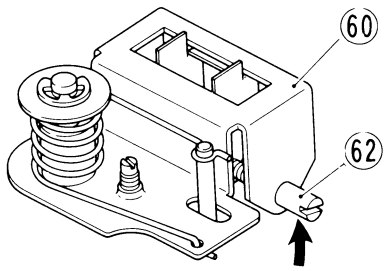
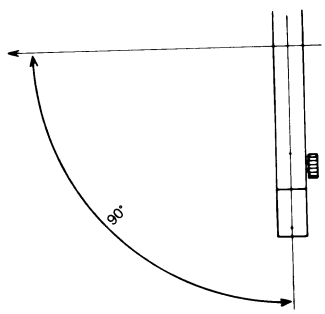


Figure 21



(C) TRACKING SENSOR SENSITIVITY AND NO. TRACKING ERROR

This adjustment is subject to rectifying the uneven sensitivity of Photo Interrupter (PI551) on the Phono PWB Assy (101).

NOTE: This adjustment has to be done without any direct sun shine nor any strong light.

1. Remove the Cabinet upper according to DISASSEMBLY INSTRUCTIONS (B) (Page 3).
2. Press the POWER button so that the unit will be switched on.
3. Connect the D.C. voltmeter between TP1 and TP3 terminals on Main PCB Assy (37) (Fig. 23).

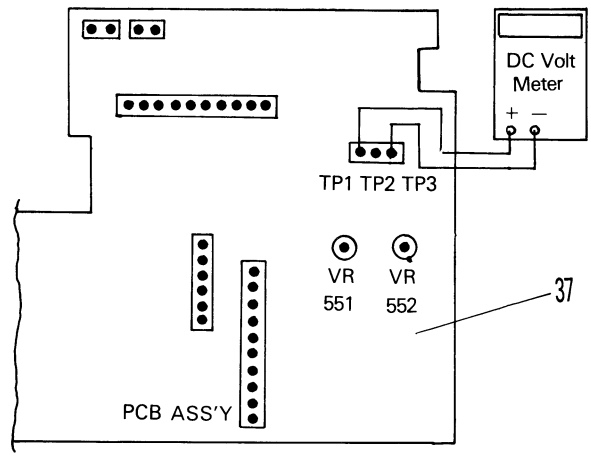


Figure. 23

4. Slightly loosen the two Screws, (103) and (114), which fasten the Phono PCB Assy (101). (Fig. 24).
5. Turn the adjusting boss counterclockwise with the screwdriver (Fig. 24).

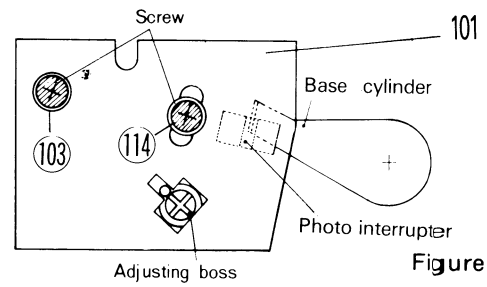


Figure 24

6. Turn the adjusting boss clockwise to be 9V (approximately 5° with the screw "A" as a center) at the DC volt meter (Fig. 25).

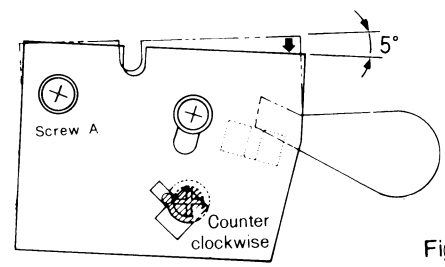


Figure 25

7. Make sure that the sensor gets enough light not being obstracted by Base cylinder
8. Turn the Variable Resistor (VR551) with a small size slotted-head screwdriver so that the voltmeter shows -3.9 ~ -4.1 volts.
9. Turn the adjusting boss with a screwdriver so that the voltmeter shows -1.4 ~ -1.7 volts.
10. Disconnect the D.C. voltmeter and re-connect it between TP2 and TP3 terminals on main PCB Assy (Fig. 26).

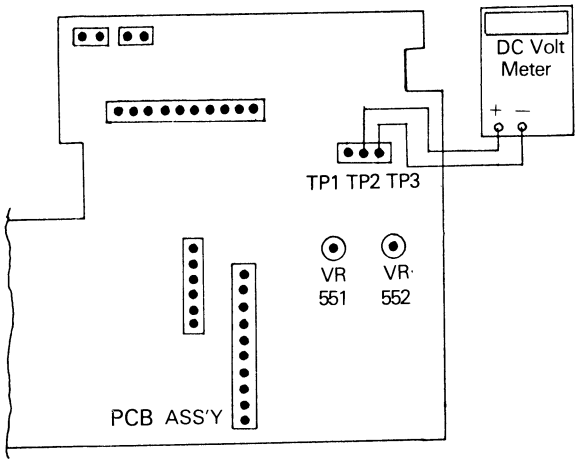


Figure. 26

11 Turn the variable Resistor (VR552) with a screw driver so that the voltmeter shows -1.3 ~ -1.7volts

12 Press the play / reject button so that stylus set-down.

13 Follow the same step as described above "11".

14 Press Play/Reject button so that tone arm moves into its rest.

15 After above adjustment, make sure to apply "STYLUS SET-DOWN" adjustment (ADJUSTMENT D, page 7).

(D) STYLUS SET-DOWN POSITION

1. Remove the Cabinet upper according to DISASSEMBLY INSTRUCTIONS (B) (page 3).
2. Press the POWER button so that the unit will be switched on.
3. Place the turntable platter and mat.
4. Use the first face of ONKYO test record ONK-1,000 for this adjustment. Press the Play/Reject button; turntable starts rotation, the tonearm will move and descend onto a record.
5. Turn the adjusting pin described in Fig. 27 so that the stylus set-down position will be counted between 15 and 17 points.
6. Using the second face of the test record ONK-1,000 make sure that the automatic return position will be counted between 19 and 24 points.

NOTE: After the above steps, no adjustment for 17 cm records is required. However, to settle the specified counting position by the first time adjustment may be difficult. Apply several times adjustments to confirm the above specified position.

(E) PITCH ADJUSTMENT OF STYLUS SET-DOWN POSITION

After fundamental adjustment mentioned above (D), pitch adjustment of stylus set-down position is available without removing the Cabinet upper.

1. Place the unit upside down on a suitable bench.
2. Stylus set-down position can be adjusted by rotating the cam through the hole which is marked in Fig. 2 with a slotted-head screwdriver.
3. Counterclockwise turn moves the set-down position inward; clockwise turn moves the set-down position outward.

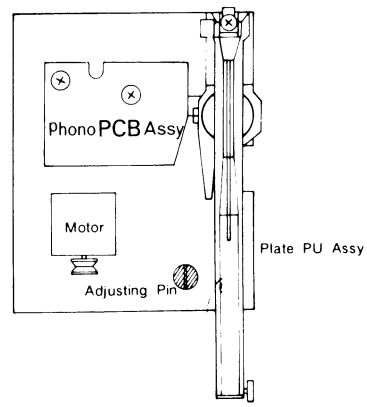


Figure 27

5. TROUBLESHOOTING

(A) THE STROBE LIGHT DOES NOT TURN ON

Measure the voltage between PT (BLUE) and PT (BLACK) terminals on Power PCB Assy (9), with A.C. voltmeter.

* Local voltage is supplied: (R901), Neon Lamp 93 or Lead-wire is defective.
* Different voltage from local one or no voltage is supplied; Power Cord No. Power Switch (SW901) or Fuse No. is defective.

(B) THE RECORD SIZE SEARCHER LIGHT DOES NOT TURN ON

Measure the voltage between GND and each ±9 volts terminals, (Q901E) and (Q902E) on main PCB Assy (37) with D.C. voltmeter.

* Approx. ±9V is supplied: Measure the voltage between 5 and 6 terminals on Tracking PCB (86) with D.C. voltmeter.
  * Approx. 18V is supplied: Lamp (31) or Lead-wire is defective.
  * Too short voltage is supplied: Cord Assy 6P (88) or connector is defective.
* Quite different voltage from +9V is supplied: (Q901), (Q903) or (Q905) is defective.
* Quite different voltage from -9V is supplied: (Q902), (Q904) or (Q906) is defective.

(C) THE TURNTABLE DOES NOT START ROTATION AFTER PLACING THE RECORD

Check to see that the base-voltage at (Q102) is approx. +9V when tonearm returns to its rest upon Play/Reject button being pressed, and the voltage is lowered by approx. 0.6V upon Play/Reject button being pressed.

* Yes: (Q103), Cord Assy 7P (95) or Direct-drive Motor (94) is defective.
* No: (IC003) or (R103) is defective.

(D) STYLUS SET-DOWN POSITION IS NOT CORRESPONDING TO THE RECORD SIZE

Check to see that the collector voltage at (Q602) against GND will be changed from approx. +9V to approx. 0V when the light through the slit on the turntable platter reaches to the Photo Transistor (Q601) on Photo TR PWB Assy (87).

NOTE: Make sure that no outside light will be reached to photo transistor during the measurement. Use D.C. voltmeter or oscilloscope for the measurement.

* No change: Photo Transistor (Q601), Cord Assy 6P (88) or (Q602) is defective.
* Changing: (IC003) is defective.

NOTE: After replacement the part the adjustment according to ADJUSTMENT (D) on page should be applied.

(E) TONEARM MOVES TOO INSIDE UPON START BUTTON BEING PRESSED

Check to see that the collector voltage at (PI701) against GND with the oscilloscope will be changed by 8 pulses per one turn (from approx. +9V to approx. 0V) according to the turn of Shifter (32) which has 8 slits.

* No change or small number of pulse: (PI701), Cord Assy 6P (88), (Q701), (Q702) or (Q703) is defective.
* Changing: (IC003) is defective.

INFORMATION: The (IC003) acknowledges that the tonearm moves to the stylus set-down and/or return position when the number of the pulse from the start point corresponds to the number programmed beforehand. After the acknowledgement, (IC003) will supply the necessary signal for various movement according to the position of tonearm.

(F) NO SOUND FROM THE LOUD SPEAKER

Measure the value of resistor between Output Cord Phono Wire (9[illegible] and its shielded part.

* 0 ohm: The Circuit (37) or (101) is shortage or muting relay is defective.
* Approx. ∞ ohm: The dead circuit or defective cartridge.

(G) NO MUTING WORKS UPON STYLUS UP ACTION

Check to see that the base-voltage at (Q301) against GND is approx. +9V when tonearm is in up position upon CUEING button being pressed, and the voltage is lowered by approx. 0.6V upon CUEING button being pressed again.

* Yes: (Q301), (Q302) or muting relay is defective.
* No: (IC003) is defective.

(H) THE TONEARM MOVES LEFT-WARD UPON UP AND DOWN ACTIONS

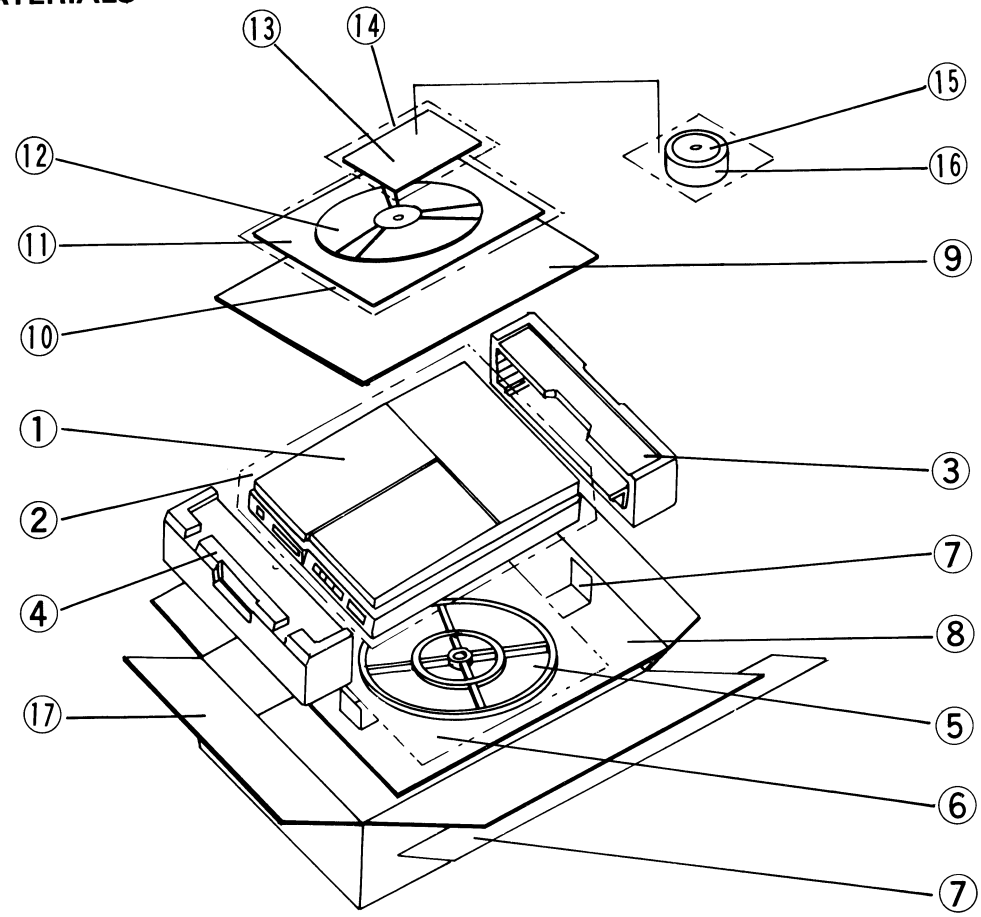
Apply ADJUSTMENTS (C), and (D) (page 6 and 7).

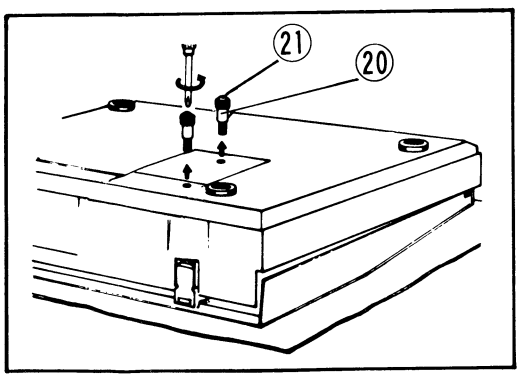
(1) THE STYLUS KICKS THE RECORD UPON ITS UP ACTIO[illegible]

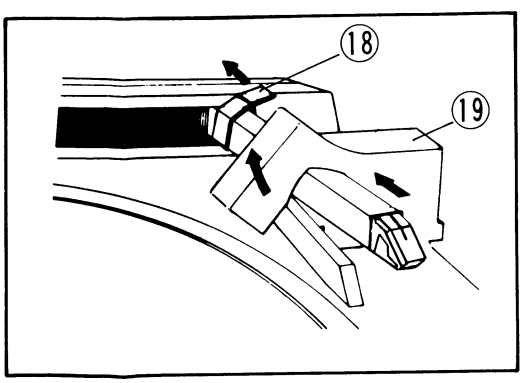
Apply ADJUSTMENTS (C), and (D) (page 6 and 7).

NOTE: The extent up to 0.2 mm fall within the specification settled. If the pitch of the record groove increases, this figure tends to increase.

6. PACKING MATERIALS

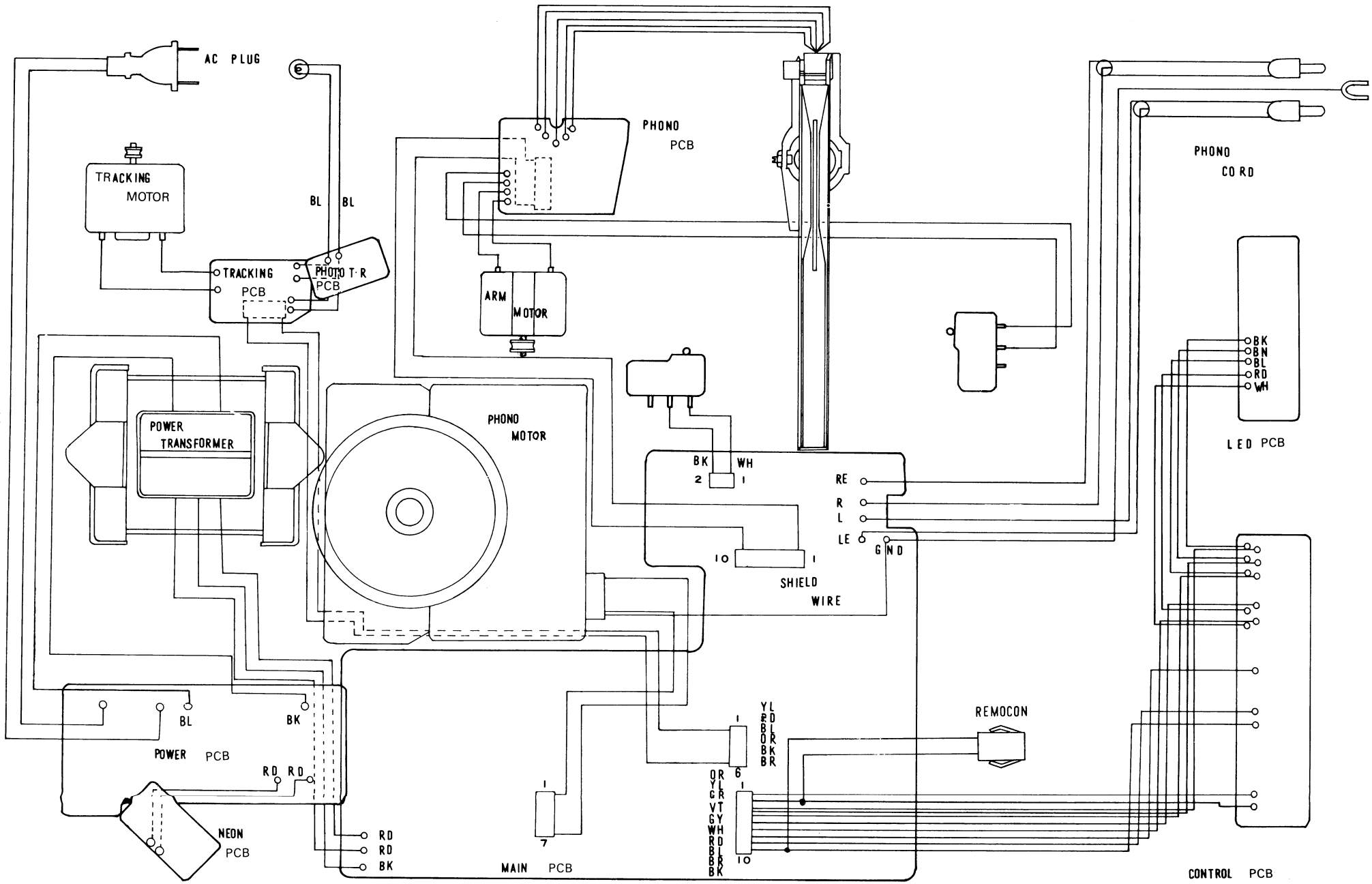




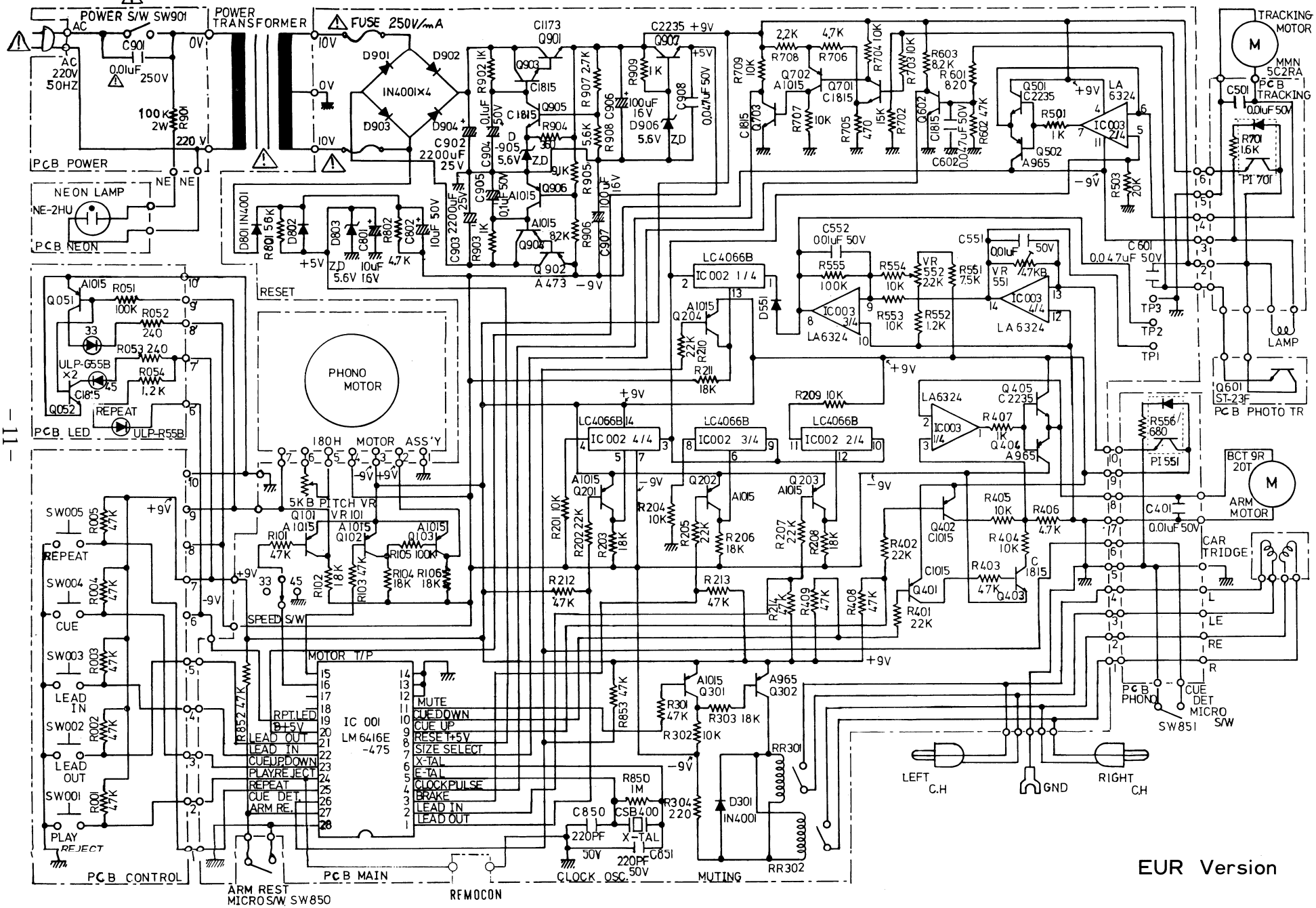


NO	DESCRIPTION	CODE NO.	Q'TY
1	SET	GSP-700	1
2	PE BAG	292M010AN208	1
3	CUSHION-REAR	447M016AN208	1
4	CUSHION-FRONT	447M017AN208	1
5	PLATTER	413M002AN208	1
6	PE BAG	292M022A N208	1
7	TAPE-MASKING	926-0007 N208	2
8	PAD-BOTTOM	295M011A N208	1
9	PAD-UPPER	295M012A N208	1
10	PE-BAG	292M023A N208	1
11	PAD-RUBBER SHEET	295M013A N208	1
12	RUBBER SHEET	231M001AN208	1
13	PE BAG	488M653A N208	1
14	INTRUCTION MANUAL	292-060A N208	1
15	ADAPTOR-45RPM	591M003AN208	1
16	PE BAG	292M021A N208	1
17	BOX-I/N	285M009AN208	1
18	PAD-TONE ARM	295A014A N208	1
19	CUSHION-TONE ARM	447M018AN208	1
20	SPACER-BASE MECH	442M004AN208	2
21	SCREW-MECH HOLDING	353M016AN208	2

7. WIRING DIAGRAMS



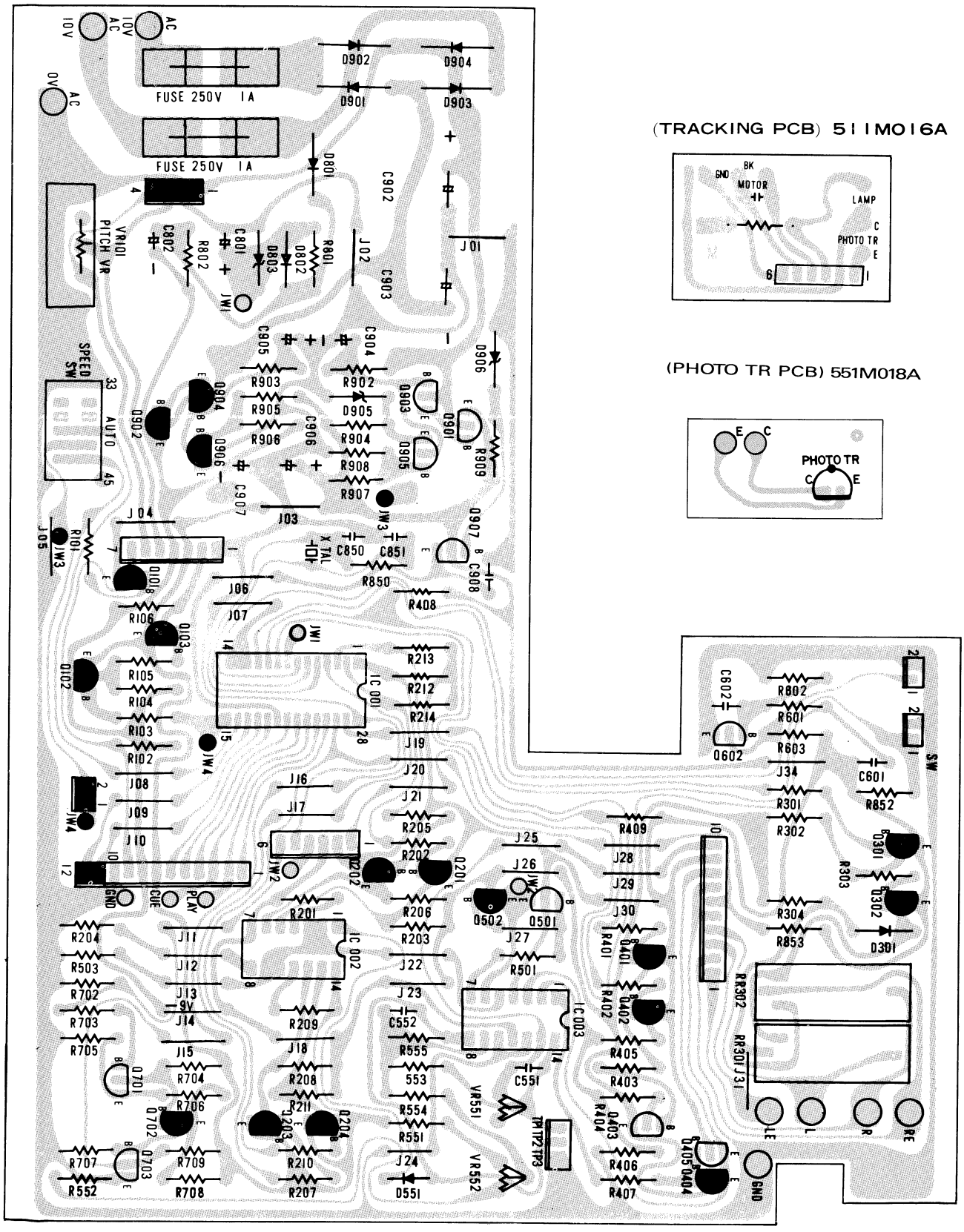
8. CONTROLLER CIRCUIT DIAGRAMS



9. PRINTED WIRING BOARDS

EUR Version

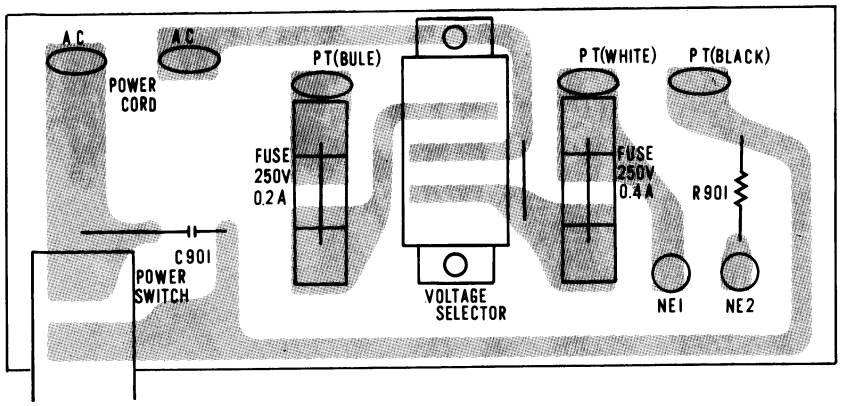
(MAIN PCB) 511M014A



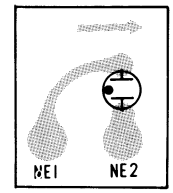
(TRACKING PCB) 511M016A

(PHOTO TR PCB) 551M018A

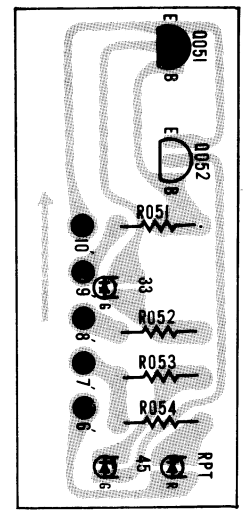
(POWER PCB) 511M017A



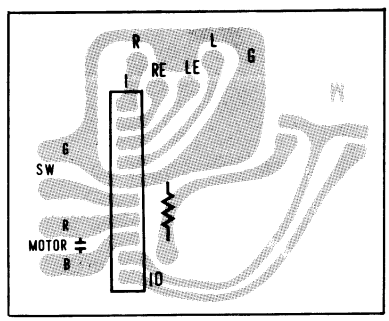
(NEON LAMP PCB)
511M019A



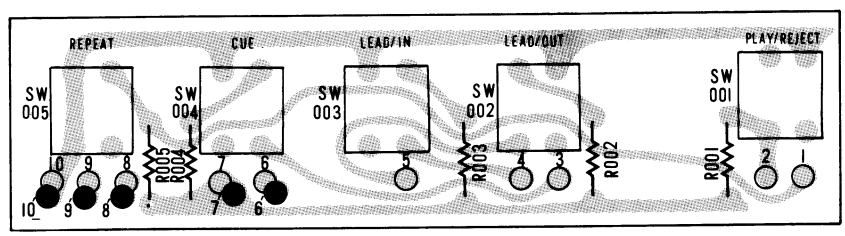
(L.E.D. PCB)
511M013A



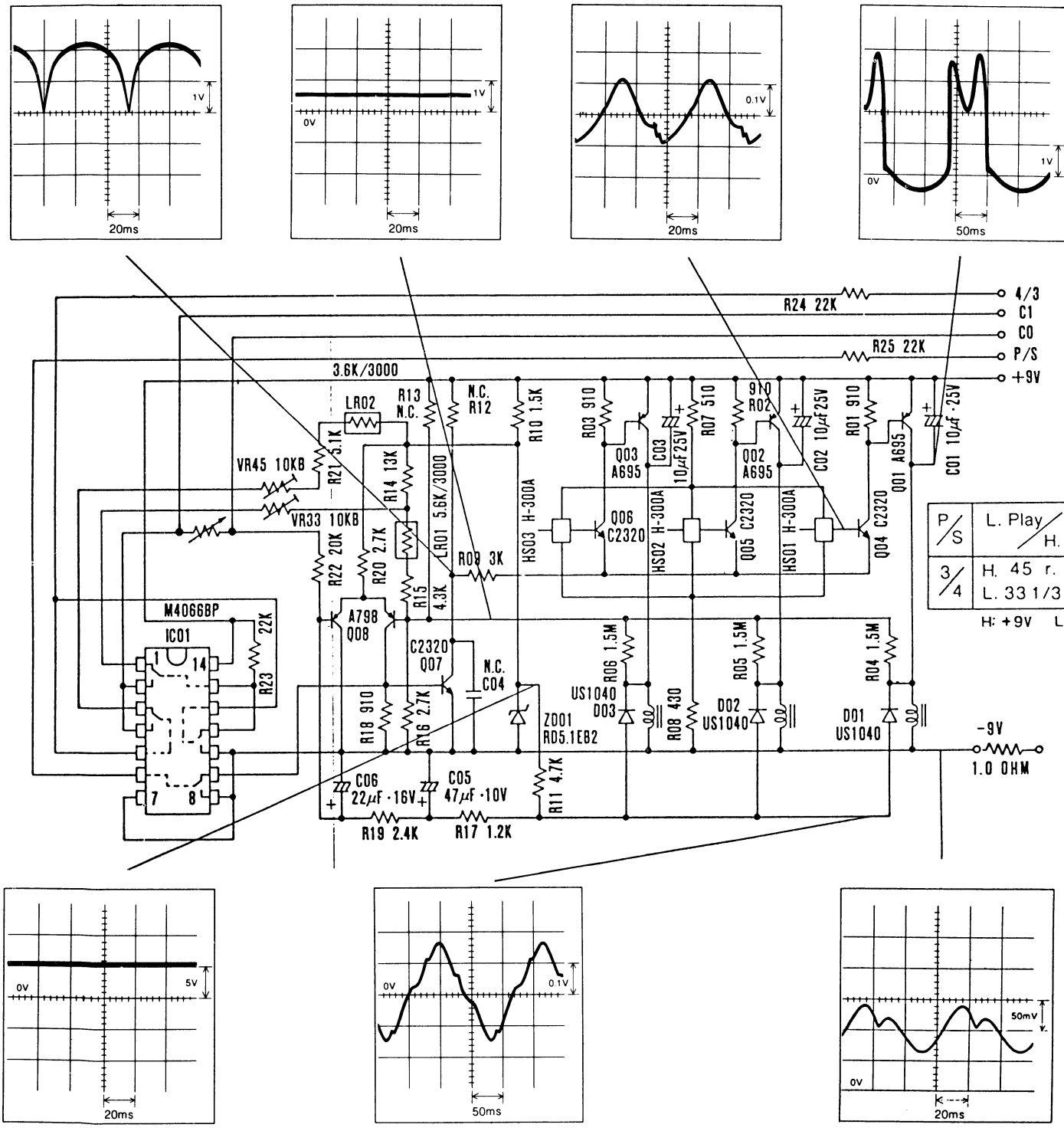
(PHONO PCB) 511M015A



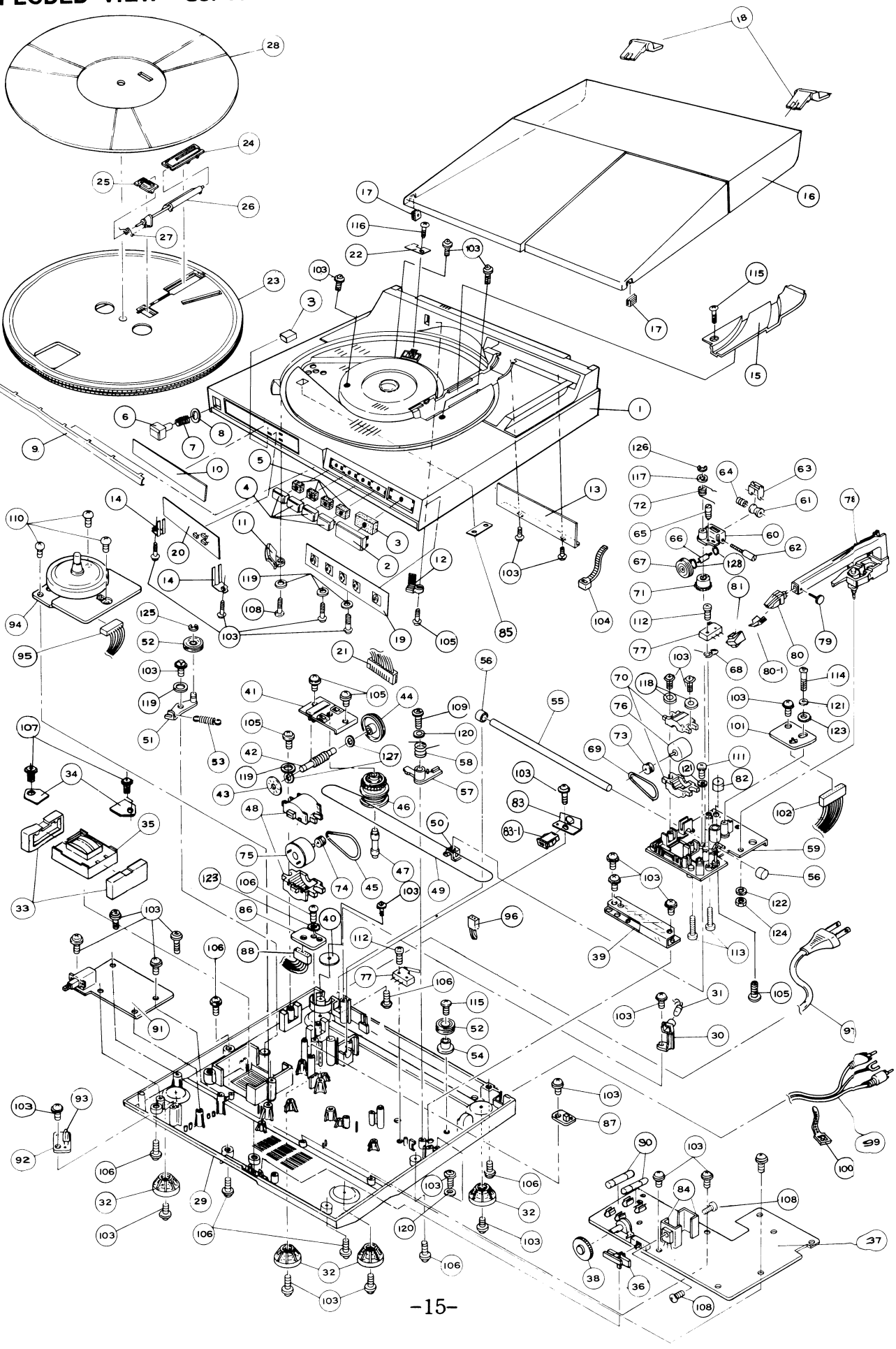
(CONTROL PCB) 511M020A



10. PHONO MOTOR CONTROL



11 EXPLODED VIEW GSP-700



12 MECHANICAL PARTS LIST

NO.	DESCRIPTION	CODE NO.	Q'TY
1	CABINET-UPPER	213M008A	1
2	KNOB-PLAY	273M030A	1
3	CUSHION-PLAY KNOB	447M012A	2
4	KNOB-FUNCTION	273M034A	4
5	CUSHION-FUNCTION KNOB	447M011A	4
6	KNOB-POWER	273M029A	1
7	KNOB-SPRING	442M024A	1
8	WASHER-SPACER	353M016A	1
9	PLATE-DECORATION	251M006A	1
10	PANEL	258M005A	1
11	FILTER-PRISM	236M007A	1
12	FILTER-LAMP	236M006A	1
13	PLATE-BACK	258M004A	1
14	HOLDER-P.C.B	324M017A	2
15	COVER	211M022A	1
16	COVER-DUST	211M023A	1
17	CUSHION-COVER	447M013A	2
18	HINGE ASS'Y	395M005A	2
19	P.C.B-CONTROL	511A020A	1
20	P.C.B.-L.E.D	511A013A	1
21	WIRE-CONNECTOR	561M017A	1
22	COVER-SENSOR	254M012A	1
23	PLATTER	413M002A	1
24	HOLDER "A"	324M014A	1
25	HOLDER "B"	324M015A	1
26	SHUTTER ASS'Y	254M013A	1
27	SPRING-SHUTTER ASS'Y	442M025A	1
28	SHEET-RUBBER	231M001A	1
29	CABINET-BOTTOM	213M009A	1
30	HOLDER-LAMP	324M018A	1
31	LAMP-PILOT	581M001A	1
32	FOOT ASS'Y-RUBBER	447M002A	4
33	CUSHION-TRANS	447M015A	2
34	BRACKET-TRANS	321M010A	2
35	POWER-TRANS	641M002A	1
36	KNOB-SELECTOR	273M033A	1
37	P.C.B-MAIN	511M014A	1
38	KNOB-PITCH	273M032A	1
39	GUIDE-WIRE	384M005A	1
40	WASHER-CORD	354M008A	1
41	PLATE ASS'Y-BEARING	321M008A	1

NO	DESCRIPTION	CODE NO.	Q'TY
42	WORM GEAR "A"	433M004A	1
43	ENCODER	995M001A	1
44	PULLEY "A"	432M007A	1
45	BELT "A"	451M006A	1
46	WORM WHEEL "A"	433M005A	1
47	SHAFT-WORM WHEEL	423M016A	1
48	COVER "A"-MOTOR	276M008A	2
49	WIRE ROPE ASS'Y	674M006A	1
50	BRACKET-WIRE	321M019A	1
51	LEVER ASS'Y	333M004A	1
52	PULLEY-WIRE ROPE	432M009A	2
53	SPRING-LEVER	442M030A	1
54	SPACER-PULLEY	341M009A	1
55	GUIDE-PIPE	384M004A	1
56	CUSHION-PIPE	447M014A	2
57	ARM	386M004A	1
58	SPRING-ARM	442M031A	1
59	BASE MECHANISM ASS'Y	225M001A	1
60	BRACKET ASS'Y-LIFTER	321M020A	1
61	GUIDE-TONE ARM	384M003A	1
62	GUIDE-ADJUST SCREW	353M008A	1
63	PROTECTOR	221M024A	1
64	LOCK SPRING-PROTECTOR	442M028A	1
65	ADJUST SCREW-LIFTER	353M007A	1
66	WORM GEAR "B"	433M003A	1
67	PULLEY "B"	432M006A	1
68	SPRING-WORM WHEEL "B"	442M026A	1
69	BELT "B"	451M005A	1
70	COVER "B"-MOTOR	276M007A	2
71	WORM WHEEL "B"	433M002A	1
72	SPRING-LIFTER	442M027A	1
73	PULLEY "B"-MOTOR	432M005A	1
74	PULLEY "A" MOTOR	432M008A	1
75	MOTOR-TRACKING	414M002A	1
76	MOTOR-ARM	414M003A	1
77	SWITCH-MICRO	558M001A	1
78	TONE-ARM ASS'Y	386M009A	1
79	KNOB-SETTING	273M031A	1
80	CARTRIDGE ASS'Y	526M003A	1
80-1	STYLUS	526M003A	1
81	CAP-STYLUS	525M004A	1

NO.	DESCRIPTION	CODE NO.	Q'TY
82	SPRING-LEVER	442M029A	1
83	BRACKET-REMOCON	995-206B	1
83-1	S.M CONNECTOR ASS'Y	563-649I	1
84	HEAT SINK	225M002A	2
85	HOLE COVER	221M002A	1
86	P.C.B-TRACKING	511M016A	1
87	P.C.B-PHOTO T.R	511M018A	1
88	CONNECTOR WIRE	561M020A	1
90	FUSE	585M001A	2
91	P.C.B.-POWER	511M017A	1
92	P.C.B-LAMP	511M019A	1
93	LAMP-NEON	582M002A	1
94	MOTOR ASS'Y-PHONO	414M005A	1
95	CONNECTOR WIRE	561M019A	1
96	CONNECTOR WIRE	561M021A	1
97	CORD-POWER	681M001A	1
99	CORD-PHONO	682M009A	1
100	CORD-BAND	328-014A	1
101	P.C.B.-PHONO	511M015A	1
102	CONNECTOR WIRE	219M003A	1
103	SCREW-TAP-WPH	219M003A	30
104	BAND-WIRE	671M009A	3
105	SCREW-TAP-WPH	TRQ1839J	8

NO	DESCRIPTION	CODE NO.	Q'TY
106	SCREW-TAP-WPH	TRQ1841J	7
107	SCREW-TAP-WPH	TRQ2003J	2
108	SCREW-TAP-PH	TRQ1830J	2
109	SCREW-TAP-PH	TRQ1836J	1
110	SCREW-TAP-BH	TRQ2239J	3
111	SCREW-PH.	MPC1826J	1
112	SCREW-TAP-PH	TRQ0939J	2
113	SCREW-TAP-PH	353M010A	2
114	SCREW-PH	MPC1849J	1
115	SCREW-TAP-TH	TRQ1837J	2
116	SCREW-TAP-TH	TRQ1430J	1
117	WASHER-PLAIN	WPA1800J	1
118	WASHER-PLAIN	WPA1900J	2
119	WAHER-PLAIN	442M030A	4
120	WASHER-PLAIN	WPA1900J	2
121	WASHER-SPRING	WSB1800J	2
122	WASHER-SPRING	WSB2200J	2
123	WASHER-TOOTHED	354M015M	2
124	NUT	352M009A	1
125	E-RING	WED1800P	1
126	E-RING	WED0900P	1
127	WASHER-POLYSILDE	WPA1800J	2
128	WASHER-POLYSILDE	WPA2200J	2

13. ELECTRICAL PARTS LIST

NO.	DESCRIPTION	RATING	CODE NO.	Q'TY	REMARK
		MAIN PCB ASS'Y			
1	PCB MAIN	207 × 163'	511M014A	1	
2	MOTOR WIRE ASS'Y		561M019 A	1	
3	PHONO CORD		682M009A	1	
4	TAP-STUD		682M010A	51	
5	WAFER	LW-0640-02	561-658B	2	
6	WAFER	LW-0640-03	561-658C	1	
7	WAFER	LW-0640-06	561-658F	1	
8	WAFER	LW-0640-07	561-658G	1	
9	WAFER	LW-0640-10	561-658J	2	
10	CPU-CUSTOM-IC	LM-6416-475	668M017A	1	IC001
11	C-MOS	LA-6324	668M018A	1	IC-003
12	C-MOS	LC-4066	668M019A	1	IC-002
13	TRANSISTOR	2SA473Y	665M019A	1	Q902
14	TRANSISTOR	2SC1173Y	664-414C	1	Q901
15	TRANSISTOR	2SA965Y	665M020A	3	Q302, 404, 502
16	TRANSISTOR	2SC2235Y	665M021A	3	Q405, 501, 907
17	TRANSISTOR	2SA1015GR	665M022A	13	Q101, 102, 103, 201 202
					203, 204, 301, 401
					402, 702, 904, 906
18	TRANSISTOR	2SC1815GR	665M023A	6	Q903, 905, 701
					703, 403, 602
19	R-CARBON-FILM	220Ω 1/8W	RD221J06	1	R304
20	R-CARBON-FILM	360Ω 1/8W	RDM001A	1	R904
21	R-CARBON-FILM	470Ω 1/8W	RD471J06	1	R705
22	R-CARBON-FILM	820Ω 1/8W	RD821J06	1	R601
23	R-CARBON-FILM	1K 1/8W	RD102J06	5	R501, 407, 902, 903
					909
24	R-CARBON-FILM	1.2K 1/8W	RD112J06	1	R552
26	R-CARBON-FILM	2.2K 1/8W	RD222J06	1	R708
27	R-CARBON-FILM	2.7K 1/8W	RD272J06	1	R907
28	R-CARBON-FILM	4.7K 1/8W	RD472J06	3	R802, 706, 406
29	R-CARBON-FILM	5.6K 1/8W	RD562J06	1	R908

NO.	DESCRIPTION	RATING	CODE NO.	Q'TY	REMARK
30	R-CARBON-FILM	7.5M 1/8W	RD752J06	1	
31	R-CARBON-FILM	8.2K 1/8W	RD822J06	2	R906, 603
32	R-CARBON-FILM	9.1K 1/8W	RD912J06	1	R905
33	R-CARBON-FILM	10K 1/8W	RD103J06	12	R204, 703, 707, 709 704, 209, 553, 554, 302 404, 405, 201
34	R-CARBON-FILM	15K 1/8W	RD153J06	1	R702
35	R-CARBON-FILM	18K 1/8W	RD183J06	8	R102, 104, 106, 203, 206, 208, 211, 303
36	R-CARBON-FILM	20K 1/8W	RD203J06	1	R503
37	R-CARBON-FILM	22K 1/8W	RD223J06	6	R210, 209, 205 202, 401, 402
38	R-CARBON-FILM	47K 1/8W	RD473J06	12	R602, 652, 101, 103, 853, 301, 403, 212 213, 408, 409, 214
39	R-CARBON-FILM	56K 1/8W	RD563J06	1	R801
40	R-CARBON-FILM	100K 1/8W	RD104J06	2	R105, 555
41	R-CARBON-FILM	1M 1/8W	RD105J06	1	R850
42	C-ELECTROLYTIC	2200μF/25V	CE228D01	2	C902, 903
43	C-ELECTROLYTIC	100μF/16V	CE107C01	2	C906, 907
44	C-ELECTROLYTIC	10μF/50V	CE106F01	1	C802
45	C-ELECTROLYTIC	10μF/16V	CE106C01	1	C801
46	C-ELECTROLYTIC	0.1μF/50V	CE104F01	2	C904, 905
47	C-CERAMIC	220PF/50V	CC221J01	2	C850, 851
48	C-CERAMIC	0.01μF/50V	CC100D56	2	C551, 552
49	C-CERAMIC	0.047μF/50V	CC470K51	3	C908, 601, 602
50	VR-STD	5KB (25m)	611M006A	1	VR101
51	VR-SEMI-FIXED	2.2KB	613M005A	1	VR552
52	VR-SEMI-FIXED	47KB	613M005B	1	VR551
53	SW-SLIDE	SSP-323	S52M019A	1	SPEED SELECTOR
54	CERAMIC-RESONATOR	CSB400P	S58M002A	1	X-TAL
55	RELAY-REED	HR-112H	557M001A	2	RR301, 302
56	FUSE	250V/1.0A	586M001A	2	220V
57	FUSE-CLIP		586M001A	4	

NO.	DESCRIPTION	RATING	CODE NO.	Q'TY	REMARK
	PHOTO TR PCB ASS'Y				
1	PCB-PHOTO TR		511M018A	1	
2	TR-PHOTO	ST23F	664M001A	1	PHOTO TR
	PHONO PCB ASS'Y				
1	PCB-PHONO	48×36	511M015A	1	
2	R-CARBON-FILM	680Ω 1/8W	RD681J06	1	
3	PHOTO-INTERRUPTERS	ON1128	664M002A	1	PI551
4	C-CERAMIC	0.01μF/50V	CC100D56	1	
	TRACKING PCB ASS'Y				
1	PCB-TRACKING	38×24	511M016A	1	
2	R-CARBON-FILM	1.6K 1/8W	RD1620A	1	
3	PHOTO-INTERRUPTERS	ON1128	664M002A	1	
4	C-CERAMIC	0.01 uF/50V	CC100D56	1	
	NEON LAMP PCB ASS'Y				
1	PCB-NEON LAMP	36×19	511M019A	1	
2	NEON-LAMP	NE2HU	582M002A	1	
3	WIRE		G05M024A	1	
	BOTTOM CABINET ASS'Y				
1	MOTOR-PHONO	180H	414M005A	1	
2	MOTOR-TRACKING	MMN-5C2RA	414M002A	1	
3	MOTOR-ARM	BCT-9R20T	414M003A	1	
4	TRANS-POWER	HT-303L	641M002A	1	⚠
5	CORD-POWER-ASS'Y		681M001A	1	⚠
6	S/W-MICRO	AV32029	558M001A	2	
7	REMOCON ASS'Y	SMP-02V-BC	563-6491	1	
8	LAMP-PILOT	20V40mA	581M001A	1	

CONTROL PCB ASS'Y

1	PCB -CONTROL	112 × 25	511M020A	1	
2	R-CARBON-FILM	47KΩ 1/8W	RD473J06	5	R001, 002, 003, 004, 005
3	SW-TACT	KHG-MA-901	556M003	5	SW001,002,003,004,005

POWER PCB ASS'Y

1	PCB -POWER	107 × 50	511M017A	1	
2					
3	R-METAL-FILM	17K 2W	RD1M012A	1	R901
4	C-POLYESTER-FILM	0.01μF/250V	CPIM001A	1	C901 ⚠
5	S/W-VOLTAGE-SELECTOR	S × 2.4D	556M001A	1	VOLTAGE SELECTOR
6	S/W-POWER	SLD-1P	556M002A	1	POWER SWITCH ⚠

LED PCB ASS'Y

1	PCB -LED	70 × 22	511M013A	1	
2	R-CARBON-FILM	240Ω 1/8W	RD241J06	2	R052, 053
3	R-CARBON-FILM	1.2KΩ 1/8W	RD122J06	1	R054
4	R-CARBON-FILM	100KΩ 1/8W	RD104J06	1	R051
5	LED	ULP-G55B	653M008A	2	
6	LED	ULP-R55B	653M009A	1	
7	TRANSISTOR	2SA1015GR	665M022A	1	Q051
8	TRANSISTOR	2SC1815GR	665M023A	1	Q052